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ABSTRACT

Evaluation is data gathering, analysis, and interpretation that leads to decisions about practices and goals. Relatively simple analytical techniques can suffice for many evaluation purposes. Evaluation of inservice education may be viewed as an operating system where input is provided, processes are implemented, and products are generated. When few factors are being considered for evaluation, tabular analytical techniques and branching diagram analysis techniques are manageable and practical. The branching diagrams use the input-process-product sequence, and can be used with questionnaire data in a variety of circumstances. Most evaluation findings lead to plausible action decisions, because they reflect a specific operation. (FG)

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EVALUATION OF INSERVICE EDUCATION:

A HARDER, MORE REVEALING LOOK ©

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THE NEED? MORE AND BETTER EVALUATION OF INSERVICE EDUCATION

The rapidly changing character of inservice education as an art and a science, even as a fad, sets the stage for more and better evaluation of practices. The 1980's promise a new formative era for professional personnel development in U.S. schools and colleges. There is much to be borrowed, adapted, and invented, as we give attention to the long neglected inservice needs of personnel, especially classroom teachers and instructional leadership staff. Such developmental efforts cry out for a sense of direction to assure steady improvements in our designs for training.

Research efforts in recent years have been all too modest as they relate to the central questions about inservice education (ISE).* Nonethe-less, researchers have been busy, despite their habit of accentuating the need for more research, while neglecting the need for its utilization. We are fortunate as practioners, that much of the research on teaching, learning, group dynamics, adult development, and systems design is applicable to the urgent needs we have in designing and evaluating for better ISE.

The growing importance of ISE in all schools throughout the land (the world, in fact) adds a sense of crisis to the problems of evaluation that can be ignored only with great risk. The recognition that all personnel can improve their performance capabilities in major ways, combines with the pressures for better education at reasonable costs, to make inservice education development a logical top priority at local, state, and national levels. I suppose we should pause here to admit that logical priorities are rarely the actual ones in any society. However, as professional instructional leaders, the logic of the urgentimportance of more and better inservice education should be compelling, and hence, guide our words and deeds as we try to influence both policy and program.

The scarcity of resources for inservice education, and even more severe restrictions on allocations to evaluation, present special challenges. Evaluation of ISE must somehow be more abundant and better, we are being told, and still cost like peanuts.

* ISE will be utilized repeatedly as an abbreviation for inservice education.

Within this context of an array of existing research findings, a growing urgency for more and better ISE, and the persistence of scarce resources, I shall try to deal with evaluation of inservice education in only three ways:

(1) Evaluation as a guidance system

(2) Systems analysis as a useful model

and (3) A few specific techniques worthy of more general application.

EVALUATION AS A GUIDANCE SYSTEM

Evaluation is seen in diverse ways by both individuals and groups. I shall be talking about ISE evaluation as a process, not an act of judging. I shall be viewing it as a guidance system for improving operations.(Stuffelbean) As such, let's be explicit about what evaluation is not:

(1) It is not research. (Bishop:145)

(2) It is not a way of taking a personal ego trip.

(3) It is not something someone does to someone else.

Obviously, there are elements of these things imbedded in any evaluation effort, but useful evaluations must be fundamentally different. In essence, evaluation <u>is</u> data gathering, analysis, and interpretations that lead to <u>decisions for action</u>. Those decisions, to effectively improve an inservice operation must be targeted to three kinds of actions:

(1) Specific existing practices should be reinforced, sustained, and protected.

(2) Specific practices should be detected at least preliminarily, as needing attention.

(3) The re-design of the operation in specific terms should be given direction.

Ideally, an effective evaluation effort will do all of these three things.

We are gradually learning to evaluate in ways that make such action oriented decisions possible. There is much we still must learn. We are still breaking out of our research-dominated crysallis. Researchers,

statisticians, and computer specialists have dominated the better efforts to evaluate ISE, but their methodologies have only limited utility for a variety of reasons which space and time do not permit me to detail. In the absence of research methods that are most appropriate, many practitioners are borrowing in rather casual ways from the public opinion pollsters. The results are hadly very productive, for the central questions of evaluation of ISE are not to be answered by opinion polling. We need methodologies of evaluation that analyze past and present events in ways that explain and predict learning outcomes.

I suggested earlier that this is a new formative era for inservice education. This is also true of evaluation for guiding ISE practices. We are borrowing methodologies from research, opinion polling and systems analysis. These borrowings must be carefully adapted. However, we need to invent and synthesize as well as to borrow and adapt; keeping in mind the unique purposes to be served. An open-minded approach is essential at this stage in the development of knowledge about ISE evaluation. Dr. Alice Rivlin, an economist and evaluation specialist, has commented rather strongly on this point. She stresses the importance of continuing to innovate and submit such innovations to careful study.

> " What works in one place or one generation will not work for another. The process of developing new methods, trying them out, modifying them, trying again, will have to be continuous." (Rivlin; 119)

Having made a modest case for rather open, unrestrained efforts to borrow, adapt, innovate and explore in evaluating ISE, a word of caution is also in order. Benjamin Bloom is hardly noted for his conservatism and caution. None-the-less, he adminishes evaluators:

> " .... I am still optimistic that evaluation studies can be improved. .... While evaluators are likely to make new errors, at least they shouldn't repeat the old errors ...." (Madaus, et al: ix)

SYSTEMS EVALUATION

One of the ways of viewing ISE and hence its evaluation is as an operating system (Thomas: 61-63). Whether we are evaluating a single two and one-half hour session, a week-long workshop, a formal course,or a district-wide (even state-wide) program, systems concepts do apply and can be useful in designing for evaluation. There is some risk involved, but over-simplification may indeed be an essential feature of an evaluation effort that is feasible and useful. So in simple terms, here is one model of any inservice education operation. (See Exhibit #1)

(1) Imputs are provided (hopefully the right ones in sufficient amounts). Money, staff, incentives, space, time, credibility, goals and objectives, materials, and participants with motives, expectations, attitudes, and past experiences.

(2) Processes are implemented (hopefully according to carefully considered designs and plans). Activities, sequences, interactions, presentations, involvements in the form of sights, sounds, feelings, ideas, tastes,etc.

(3) Products are generated (hopefully the desired ones with limited negative side effects). Knowledges, information, understandings, concerns, ideas, skills, attitudes, concepts, values, behavior patterns, feelings, etc.

(EXHIBIT #1 ABOUT HERE)

Every reader will, of course, be making mental notes on the specific forms of imputs, processes, and products omitted in my listings. They are illustrative only, but serve, I hope, to suggest three quite complex and yet somewhat distinctive categories of events --- past, present and future. Because they are such complex sets of events, the evaluation task is to

EXHIBIT # 1

OVER-SIMPLIFICATION
OF A SYSTEM MODEL

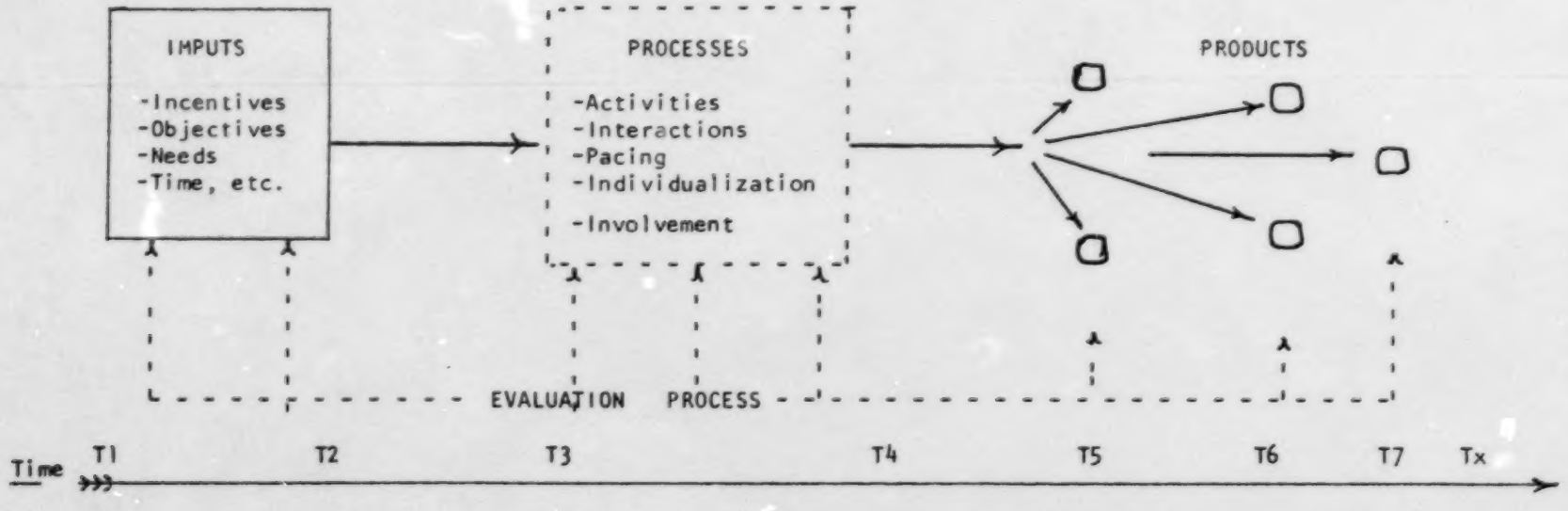

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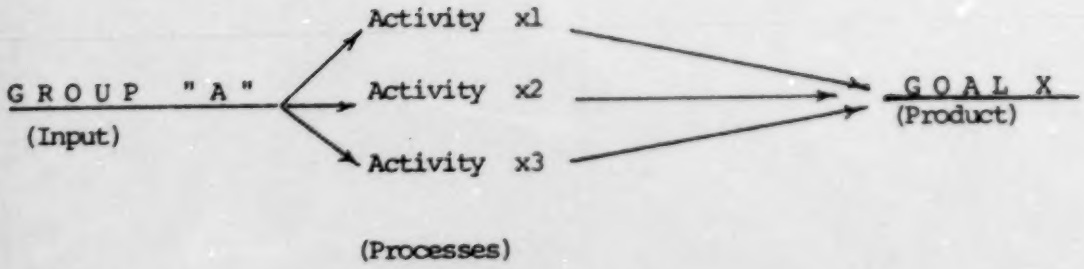
EXHIBIT # 2

A SIMPLE SERIES OF ACTIVITIES AS A SYSTEM



simplify and select; to screen in and out, attending only to certain events most clearly related to the system's operation. Selecting and simplification are essential because all events cannot be studied, and extensive analyses are impractical. Because the events of selected importance are spread over time, the evaluation effort must be tuned to an appropriate time-frame, must begin before the operation begins, and continue after it comes to an end.

A less abstract, somewhat more operational view of inservice education as systems is shown here (see Exhibit # 2) . Imputs as shown are limited to a designated group of participants. In overly simplified form, processes are viewed only as activities in the training effort, while products are referred to simply as goals achieved (Harris, 1975: 49).

(EXHIBIT #2 ABOUT HERE)

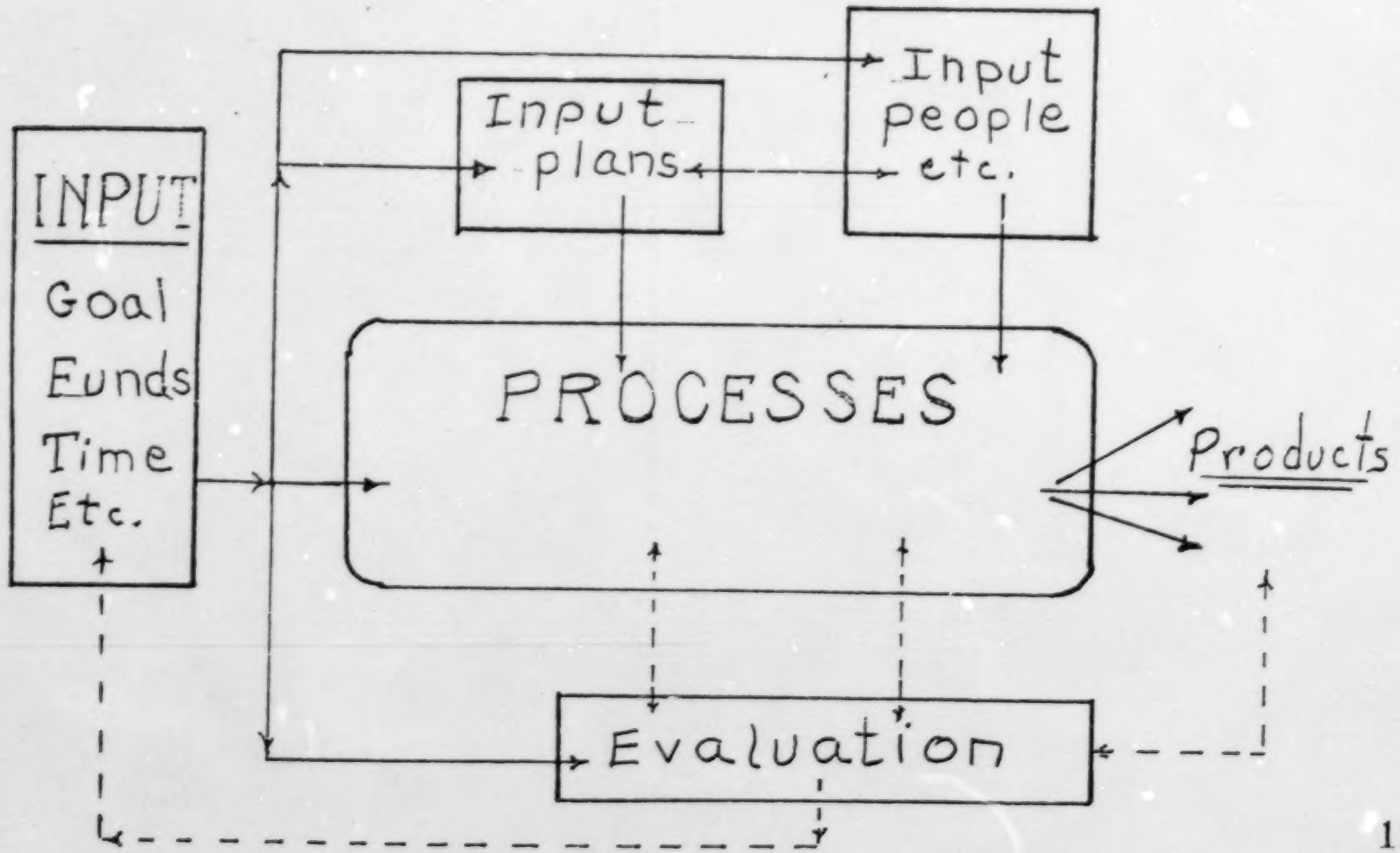
As simplistic as this seems, it is a useful way of conceptualizing for evaluation as well as for planning purposes. Variations on the same configuration of a system are easily recognized if more complex designs are being evaluated. Multiple imputs involving various sets of participants may, of course, be involved at times. Multiple sets of activities may need to be recognized as different processes. And, of course, different products or outcomes are often of importance in evaluation design.

A systems view of inservice education as a on-going program or programs of operation is presented in Exhibit #3. This too is only schematic in its attempt to suggest a set of imput categories that are of special concern when evaluation of large programmatic types are undertaken. This exhibit also suggests the relationship of an on-going system of evaluation to the various other components of the operation.

(EXHIBIT #3 ABOUT HERE)

EXHIBIT # 3

SYSTEM VIEW OF INSERVICE



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METHODS AND TECHNIQUES

The utility of systems concepts in evaluating inservice education (ISE) is, perhaps, greatest in analyzing and interpreting data. The selection of specific factors or variables in terms of their importance to the ISE operation has been stressed. Instrumentation for data gathering will be by-passed in this discussion in order to highlight a few techniques for analyzing and interpreting results when only a few factors are being considered. In illustrating some evaluation efforts of mine as well as some of my students, a variety of factors that seem useful will be reviewed. Most of these factors have been selected for their apparent importance as reflected in research on effectiveness. But equally important as a selection criterion is one of manageability. Factors selected should be those which can be dealt with in very practical ways.

Tabular Analytical Techniques

A common practice in analyzing data is to tabulate frequencies of responses or scores or other events. This assists in making the raw mass of data more manageable. A data reduction process of some kind is almost always necessary before interpretations can follow. Exhibit #4 illustrates an analysis for three measures derived from an evaluation of a Taba Teaching Strategies training program in a Houston area school district. Attitudes of teachers, teacher use of strategies, and pupil achievement scores are tabulated for thirty-two teacher participants in the program. Interesting as this display is, it doesn't offer much help with interpretations and can hardly lead to decisions for action.

(EXHIBIT # 4 ABOUT HERE)

A two-by-two analysis technique is illustrated in Exhibit #5 using the same Taba training program data. Only two of the three factors are employed in this analysis --- teacher use and pupil achievement.

EXHIBIT = 4

Frequency Tabulation - Taba Data

	(N)	Scaled Scores LOW	MIDDLE	HIGH
Input				
Attitude	(32)	7	12	13
Process				
Teacher Use	(32)	5	9	18
Product				
Pupil Ach.	(32)	11	10	11

EXHIBIT #5

TWO-WAY ANALYSIS - Taba Data

Process (use)	Product (Achvmt) High	Product (Achvmt) Low	Total
High	9 = 28%	8 = 25%	17
Low	8 = 25%	7 = 22%	15

Even so, the display is somewhat more easily interpretable. At least we can see that each combination of leve's of teacher use with pupil achievement occurs with nearly equal frequency. This doesn't lead to action decisions, but does suggest caution in claiming an unqualified accomplishment. Of course, other analyses of this same 2x2 design need to be undertaken to relate teacher attitudes to teacher use to pupil achievement. Three displays of this same kind could be revealing.

Multi-Variate Techniques

Systems analysis requires that various inputs, processes, and products be related to each other in a logically sequential manner. A branching diagram analysis technique was developed by Harris (1975:150) some years ago to facilitate handling three factors while still employing the systems model concepts. In Exhibit #6 the input → process → product sequence is retained and the three sets of data are analyzed accordingly. Each set of data on each factor is shown as frequencies, but now quite differently displayed.

(EXHIBIT # 6 ABOUT HERE)

Such a data display can be read and interpreted in the following manner:

(1) The 16 teachers whose attitudes were most positive toward the Taba strategies utilized them most in 13 instances. Furthermore eight out of the 13 high attitude/high use teachers had high achieving student groups as measured by selected related test scores.

This is not a very reassuring interpretation, but is is not complete either.

(8) The 16 teachers with low positive attitudes toward the Taba strategies were also low users in 12 out of 16 instances, but only five of these twelve low attitude/low use teachers had student groups scoring low on selected test measures.

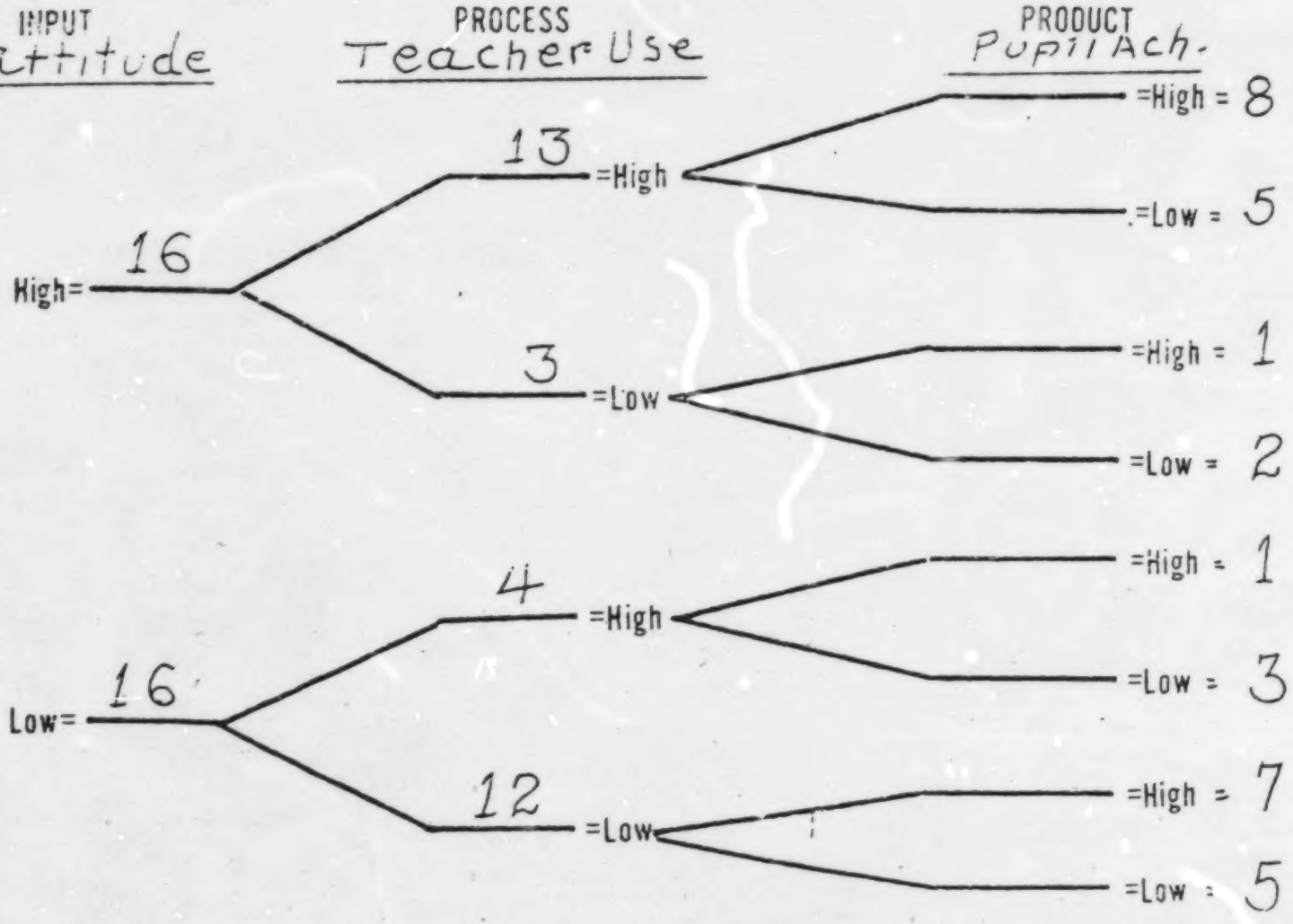
Further interpretations of branches (3) and (4) and (5) and (6) lead to fairly consistent and firm evidence that attitude imputs as measured here are definitely associated with teacher use of the Taba strategies. The same cannot be said for pupil achievement.

Evaluation findings are not always encouraging. The evaluator must frequently take comfort in the words of Thomas A. Edison when one of his experiments failed. 'Well, that's one more thing I know that doesn't work". In actual fact, this analysis proved to be the key to the next step in

EXHIBIT #6

BRANCHING DIAGRAM INPUT–PROCESS–PRODUCT RELATIONSHIPS

FOR TABA INSERVICE



this evaluation. Further analysis, using the same branching technique showed that positive results were obtained for certain kinds of student groups, but not for others. (Carthel, 1973)

Branching Diagrams with Questionnaire Data

Evaluating individual sessions presents feasibility problems. Practioners cannot afford the time and effort for elaborate data gathering for every training session. A single post-session questionnaire has been quite useful to me in several situations. Participants utilize 5 to 10 minutes at the end of the session responding to questions about why they came, how actively they were involved, what objectives they sought in attending, and what they got out of the experience? These are expressions of opinions to some degree, but the use of a carefully structured questionnaire format gives some assurances of objectivity and reliability. Responses are always elicited in ways that assure annonymity for the participants.

Exhibit # 7 shows a completed branching diagram for a group of participants in an Alabama school system. Forty-two participants responded after a three hour session. Reasons of attending were checked, involvement levels in an array of activities were estimated, and three types of outcomes were rated. These various raw data were scaled to produce variables which were then analyzed using the high/low splitting procedures illustrated above.

(EXHIBIT # 7 ABOUT HERE)

In this illustration, a very interesting pattern appears. More highly motivated participants (25) do not overwhelmingly report high outcomes, BUT high motivated/low involved participants are predominantly those reporting low outcomes. Consistent with this, low motivation/low involved participants report low outcomes even more consistently.

This branching diagram leads to a conclusion that motivation for attending is not clearly associated with involvement. Furthermore, involvement is only somewhat associated with outcomes. These findings, once again, lead the evaluator to look upon motivation for attending and involvement as quite independent factors. Efforts may be needed to design such sessions for these participants to emphasize more directly involving activities regardless of motives for attending. Obviously,

Exhibit # 7

ILLUSTRATION OF THE USE OF BRANCHING DIAGRAM ANALYSIS
MOTIVATION, INVOLVEMENT, AND OUTCOMES

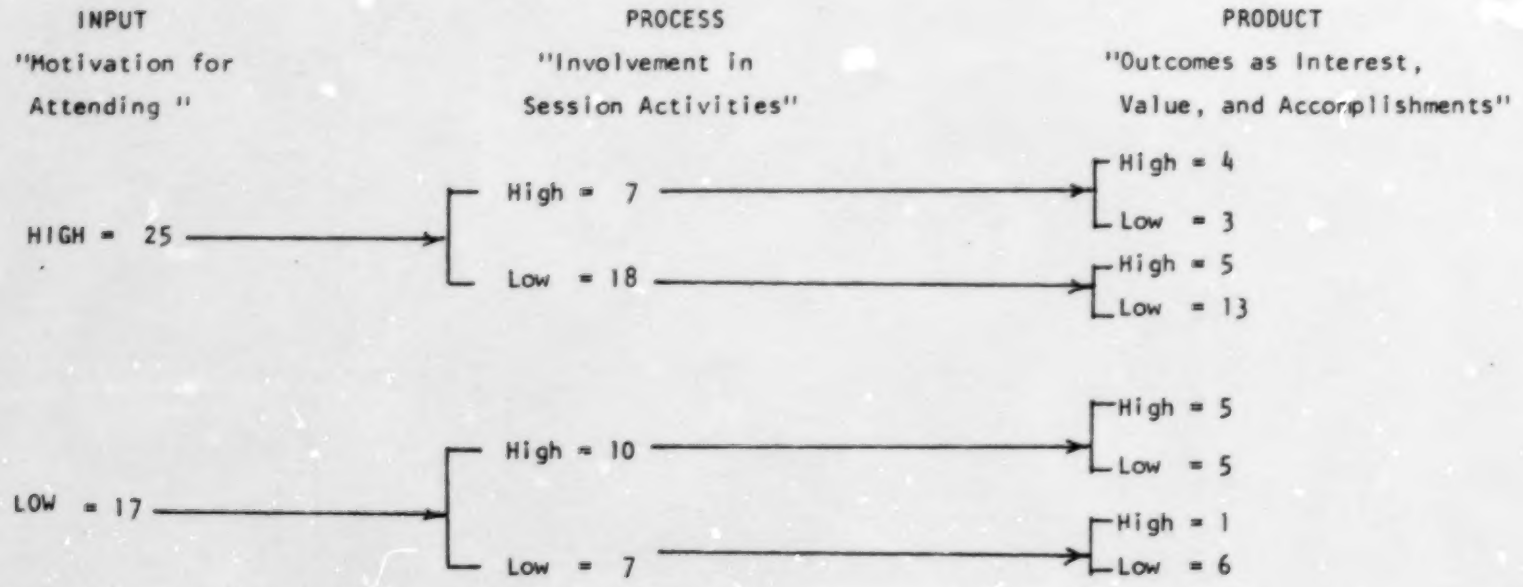


Exhibit #8

Outcome Scores for Participants
by Sub-Sets of Motivation/Objectives Levels

Participants	No. of Participants	Outcomes Mean	Outcomes Range
(1) Highly motivated* but low objectives** (realists, eager?)	7	8.86	7 - 12
(2) Highly motivated and high objectives** (too gung-ho?)	18	8.21	4 - 12
(3) Low motivation* and low objectives too (disinterested?)	11	7.82	6 - 11
(4) Low motivation, but high objectives (show me skeptics?)	6	5.00	1*** - 9
Total	42	8.12	1 - 12

* Weighted scores of 2 or 3 = high, low = 0 or 1

** Weighted scores of 3 = high, 1 or 2 = low.

*** Includes one set of responses in which only one scale was marked.

the evaluator may also want to look at other factors influencing this input and this process.

Exhibit # 8 illustrates another technique for probing still further to understand what the data provided by participants might mean. Since involvement was at least somewhat associated with outcomes reported, an effort was made to clarify the influence of motivation for attending as an input. Four sub-sets of participants were designated on the basis of their responses to two different input items on the questionnaire.The new input measure utilized in this analysis was the level of complexity of objectives reflected in the expectations of the participants. These four sub-sets of participants are characterized as "eager realists", "too gung-ho" , "disinterested", and "show me skeptics". Of course there is no way of knowing that these characterization are correct, but they seem logically possible.

(EXHIBIT # 8 ABOUT HERE)

The interesting finding from the analysis displayed in Exhibit #8 is revealed in the declinging mean outcome scores for each of the four sub-sets of participants. One might cautiously draw an interpretation for this exhibit that reasons for attending do relate to outcomes, but only as associated with participant expectations. The action decisions might involve some effort to lower the unrealistic objectives of certain participants with better advance organizers. Whether modifications in participant motivations for attending can be promoted is less clear, but a policy review might be in order.

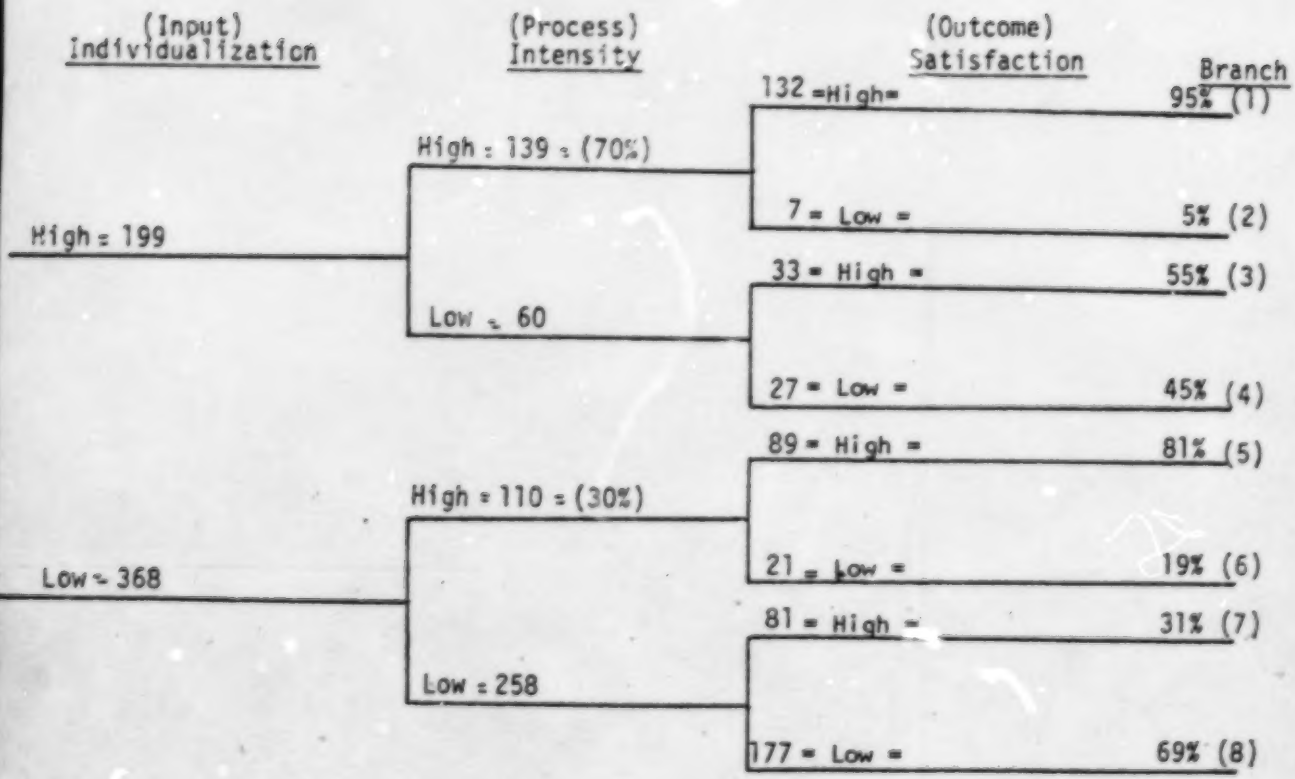
Other Illustrations with Branching Diagram Analysis

The unusual adaptability of Harris' Branching Diagram Analysis Technique for use in a wide variety of circumstances, using many kinds of data has been demonstrated in numerous evaluation studies. I will not try to do more than introduce a few additional illustrations.

In a recently completed study of three different inservice education education delivery systems, Nancy Hagen (1981) analyzed individualization as a input factor, intensity of training experience as a process factor, and teacher expressed satisfaction with the whole operation as a product. Exhibit #9 is a branching diagram for over five hundred teacher respon-

Exhibit # 9

Branching Design for All Systems



dents in this study.

(EXHIBIT # 9 ABOUT HERE)

Strong positive relationships are shown in this exhibit between individualization, intensity of experience and teacher perceived satisfaction. Intensity of experience appears more influential than individualization. The action alternatives from such strong findings are also rather clear. Design for intensity ! Individualize activities as much as possible, but above all offer intense experiences. Look at every training session critically. Are the activities multi-sensory? Will participants be active rather than passive? Will activities have a logical sequence, be varied and paced for intense interactions?

None of these action decisions leads inservice trainers into the strange unknown. Quite to the contrary. Most evaluation findings lead to perfectly plausible courses of action. The potential in such evaluation findings is great because they reflect a specific operation. Unlike research findings, these tell a story about things happening under your direction in the local setting. The action decisions are directed toward changes within each reach. The need for action is often much more compelling.

In an effort to improve conference planning for the Association for Supervision and Curriculum Development, a committee made use of branching diagram analysis techniques a few years ago in San Francisco. A large national conference with some 5,000 participants attending hundreds of different events presents a truly bewildering evaluation problem. We decided to attempt only a modest effort. Sample sessions were selected, a team of process observers were partially trained, and a random sample of participants were given questionnaires on entry to selected sessions. Process observer teams of three to five individuals distributed questionnaires, remained to analyze session activities, and then picked up completed questionnaires at adjournment time. A central tabulation/analysis office was established so analysis could proceed even as the conference progressed. At a final session, a preliminary evaluation report was presented with a formal report following.

The analysis of sessions by position of participants issustrates one of the various branching diagrams prepared for the ASCD. Exhibit #10 shows one such input - process - product analysis.

(EXHIBIT #10 ABOUT HERE)

Experience impact appears highly associated with the supervisors' estimates of the professional worth of the sessions. This is clearly not so for administrators as their estimates of professional worth tend to be low more often, regardless of the level of experience impact provided by session activities.

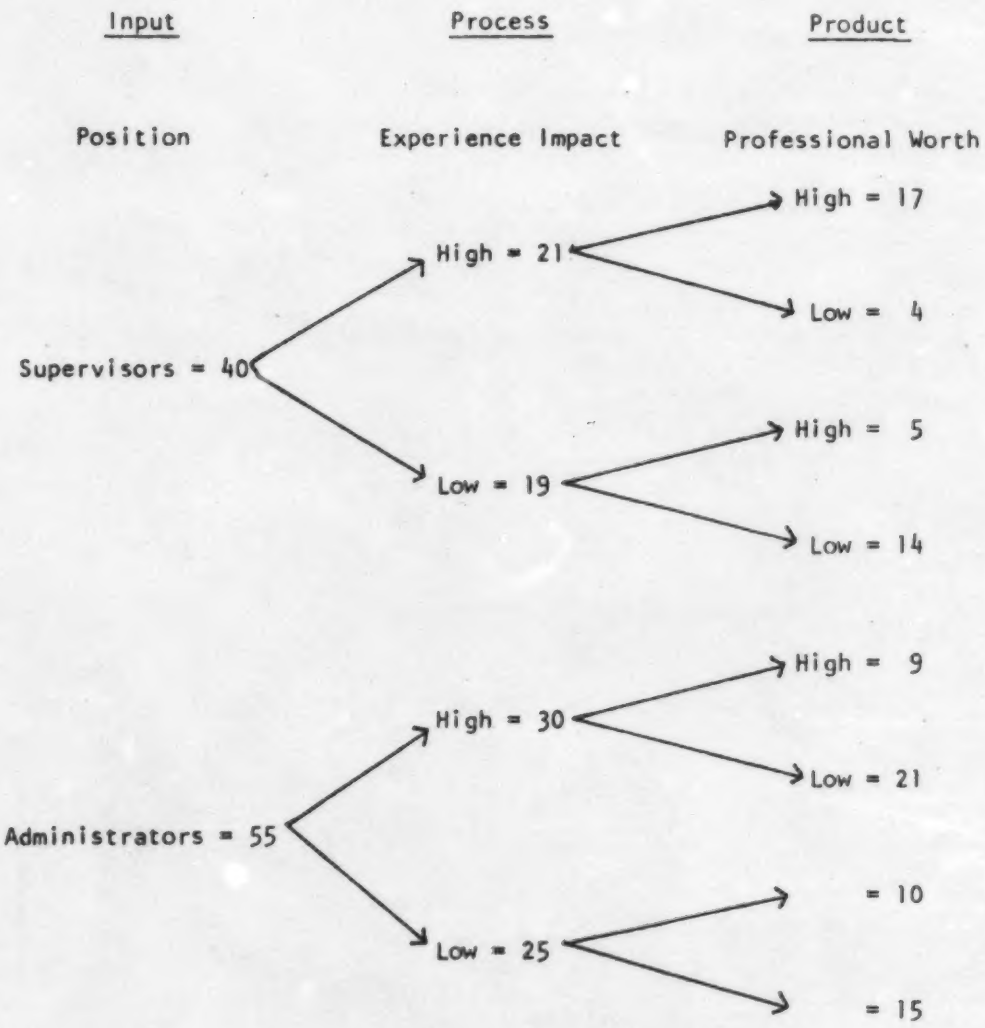
An effort to evaluate a state-wide program of school improvement planning is being completed at this time by Jerry Christian (1981). He has utilized branching technique among others to relate commitment of school officials as an input to extent of training provided as process, to implementation of new program plans as product. These data analyzed in this manner clearly support commitment of school officials as essential in making best use of inservice training to implement new programs.

Still another context for evaluation involved a survey of all school districts (Virginia, 1979) in the State of Virginia. Working with a state advisory committee we utilized rather simplistic survey procedures to secure data on current inservice education practices across that state. Branching diagram analysis was utilized as one of the analytical techniques. One diagram utilized data on the allocation of released time for inservice education on an input measure. It was determined that school-based inservice programs were not making efficient ue of released time in promoting teacher involvement as well as were inservice programs organized in different ways. Other findings revealed inputs that were more likely to promote high experience impact activities (Harris, 1980) in training programs.

EXHIBIT #10

Harris' BRANCHING DIAGRAM

Illustration of Positional Analysis for
ASCD's San Francisco Conference



CLOSING COMMENTS

In arguing for better, harder, more revealing evaluation of inservice education, I have suggested that viewing training operations in schools and colleges as systems is helpful. I've ignored data gathering problems in an effort to emphasize one way of using the "systems view" as a framework for analysis. In doing this, I've illustrated a variety of uses of my branching diagram analysis technique.*

Emphasizing a single technique is intended to stimulate its use among any of you so inclined. However, more importantly, I have tried to emphasize by implication, several other ideas:

(1) Relatively simple analytical techniques can suffice for many evaluation purposes.

(2) Statistical analyses, while sometimes useful, are not necessary for multi-variate analysis purposes.

(3) A variety of kinds of data can be scaled for analysis of relationships, but finally, let me emphasize another point.

(4) Analysis and interpretations must concentrate on a few selected, important, manageable factors.

In various ways I have referred to "practioners", "evaluators", "researchers", and "participants" as though these were completely separate sets of people. In fact, these are better thought of as roles people play; for we are often multiple performers. As a closing proposition, I would argue that evaluation of inservice education should be a fully shared responsibility among administrators, trainers, leaders, participants, and evaluation specialists. Evaluation data and the findings derived will be better understood by those involved in the analytical process. Action decisions do not come from findings; they emerge out of interpretations which only those most directly involved in the inservice education operations can make. Commitment to improving ISE will be stronger among those who have been directly involved in the evaluation process.

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* The reader who wishes to apply branching to selected training situations can gain further detail on procedures in Harris' (1980) chapter on evaluation of inservice programs. Appendices material in that volume provides raw data for trying the techniques.

Evaluation is important as a guidance system leading to better in-service education. Without data we cannot see; without involvement in the evaluation process we will not see.

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